

REMARKS

The claims are 10 and 11. Claim 10 includes the subject matter of former claims 7 and 8. Claim 9 is revised as new claim 11. In addition, claim 10 recites the environment for conducting the claimed method and better defines the intended invention. Consideration of claims 10 and 11 is expressly requested.

Claim 7-9 were rejected as anticipated by Page, Jr., U.S. 4,908,243 (hereafter Page '243). The Examiner relies on Page '243, column 5, lines 34-55, for a disclosure of a plurality of shut-off valves 28 and 18 and for a disclosure that valve 28 and valve 18 on the purge gas side are closed during film-formation. The Examiner argues pressure on the purge gas side will be reduced when reactant gas flows during film deposition since valves 28 and 18 are closed. The grounds of rejection are respectfully traversed.

Prior to addressing the grounds of rejection, Applicants wish to briefly review certain key features and advantages of the present claimed invention. As illustrated in Figs. 1 and 2 of the present invention, a plurality of shut-valves is provided between a non-reactive gas source and reaction chamber 112. In the instant method pressure is reduced between valves 105 and 110, for example, to reduce purge gas and to facilitate detection of gas leakage in at least one of the shut-off valves. Thereafter, the shut-off valves are closed and, while the shut-off valves are in a closed position, a source gas is supplied into the chamber. The source gas can be supplied, for example, through valve 109, which valve is independent from shut-off valve 110.

It is relatively simple to determine whether or not any gas leakage in a shut-off valve occurs during the deposition process, since either a pressure gauge (111) or an evacuating means 118 are provided in the system. Accordingly, the present process prevents a degradation of the characteristics of a deposited film even when gas leakage occurs, since such leakage can be readily detected and the problem resolved.

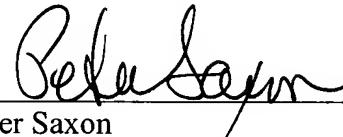
The Examiner relies on valve 18 of Page '243 as being one of the plurality of shut-off valves provided between a purge gas source and the chamber. However, quartz valve 18 additionally supplies carrier gas and vaporized reactant to reaction chamber 40. As noted in column 5, lines 50-55 of Page, in normal operation the flow of carrier gas and vaporized reactant lifts quartz check 21 off valve seat 37 to allow passage of the stream through quartz valve 18 for delivery into deposition vessel 40.

Accordingly, valve 18 is open during the deposition process, since it supplies carrier and reactant to the deposition chamber. Accordingly, Page fails to teach that the shut-off valves remain closed when supplying a source gas into the chamber to form the deposited film. Further, to shut-off the purge system in Page, valves 28 and 29 are closed, see column 5, lines 43-44. Importantly, there is no teaching or disclosure that to facilitate detection of gas leakage in a shut-off valve, the pressure between valve 28 and quartz valve 18 should be reduced prior to closing such valves. Finally, since quartz valve 18 is the main inlet valve for the reactive gas, it cannot be shut during the deposition process without destroying Page as a viable process.

Wherefore, Applicants submit that the claim should be allowed and the case passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

  
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